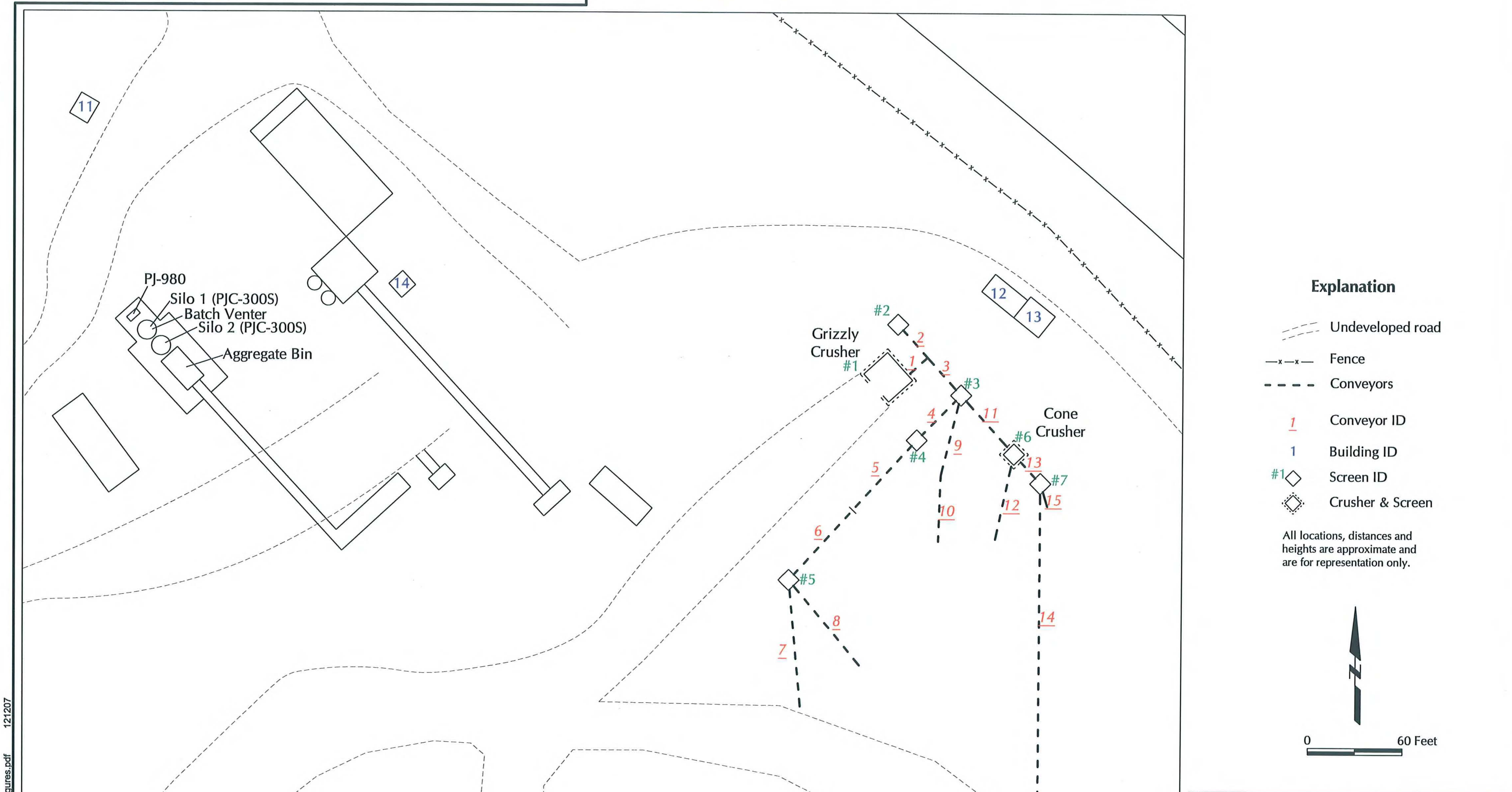
DRAWN: Jasper Geographics 12/12/07 CHECKED: NP December 2007



Plot Plan: Concrete Batch Plant and Rock Crusher

Zanetti Brothers Facility
Concrete Batch Plant PTC

LFR

Figure 2

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Zanetti Bros., Inc.	Facility Name: Plant Yard	Facility ID No: 079-00004
Brief Project Description: Concrete Batch Transit Mix Plant, Previously Permitted Rock Crusher		

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO * If YES, applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]	☐ YES*
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☒ NO *If YES, please identify sub-part: _____	☐ YES*
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	☒ NO *If YES, please identify sub-part: _____	☐ YES*
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO *If YES, please identify sub-part: _____	☐ YES*
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO *If YES, please attach netting calculations	☐ YES*

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

AIR DISPERSION MODELING SUMMARY

TABLE OF CONTENTS

1.0 INTRODUCTION

Zanetti Bros., Inc. is proposing to construct and operate a new concrete batch plant (CBP) at their facility in Osburn, Idaho where they currently operate a rock crusher (RC). The location of the facility is shown on the enclosed topographic maps. Criteria pollutant emissions, which include only particulate matter (PM_{10}) and lead, as well as toxic air pollutant (TAP) emissions are summarized in the emissions inventory spreadsheets included as part of the application package. As shown in the spreadsheets, total PM_{10} emissions for the proposed CBP and the existing RC combined are less than the modeling thresholds of 0.9 pound per hour (lb/hr) and 7 tons per year (tons/yr). Also, the increase in lead emissions from the CBP is less than the modeling thresholds of 100 pounds per month (lb/mo) and 0.6 tons/yr for lead. With respect to TAPs, emission factors are available for three of the CBP air emission sources – cement delivery to the silo, cement supplement delivery to the silo, and truck mixing (loadout). No emission factors are available for TAPs from other air emission sources at the CBP or from the RC.

Although controlled TAP emissions from the proposed CBP do not exceed the IDAPA screening emission levels (EL) for any TAP, uncontrolled emissions from the CBP exceed the EL for arsenic, nickel, and chromium VI. Therefore, the Idaho Department of Environmental Quality (DEQ) is requiring an ambient air quality impact analysis (i.e., air dispersion modeling) for these three TAPs to demonstrate compliance with the acceptable ambient concentrations (AAC). Because each of these TAPs is a carcinogen, annual air quality impacts must be determined for comparison to the AACCs listed in Section 586 of IDAPA 58.01.01.

This document describes the methodology which was used to conduct the modeling, including the selected model, model input data, and model options. The modeling methodology was based on discussions with the DEQ. All modeling was conducted in accordance with the *State of Idaho Air Quality Modeling Guidance* (December 2002), the *DEQ Toxic Air Pollutant (TAP) Preconstruction Compliance Application Completeness Checklist* (the TAPs Checklist) (January 2007), the requirements outlined in IDAPA 58.01.01.210 *Demonstration of Preconstruction Compliance with Toxic Standards*, and communications with the DEQ. Method C, TAP Compliance Using Controlled Ambient Concentrations (Section 210.08), of the TAPs Checklist was selected as the compliance method for TAPs from the proposed CBP.

The area in which Zanetti Bros. facility is located is rural with both simple and complex terrain. Therefore, both simple terrain and complex terrain modeling were performed, utilizing the EPA SCREEN3 model. There are no other nearby facilities to include in the analyses.

2.0 SOURCE EMISSIONS AND STACK PARAMETERS

As mentioned above, three air emission sources at the proposed CBP were including in the modeling analysis – cement delivery to the silo, cement supplement delivery to the silo, and the truck mixer (loadout). Each of these sources is controlled with a baghouse with the stack parameters listed on the attached Form MI2. Thus, these three sources were considered point sources in the modeling. Controlled emissions for each of the TAPs (arsenic, nickel, and chromium VI) are presented in the enclosed TAP Emissions Inventory spreadsheet. As indicated in this spreadsheet, emission factors for the three TAPs were obtained from Table 11.12-8 of Section 11.12, Concrete Batching, of EPA's *Compilation of Air Pollutant Emission Factors* (June 2006). An emission rate of one (1) lb/hr was assumed for each of the three sources modeled. The predicted model results based on the one lb/hr emission rate were then ratioed utilizing the controlled lb/hr annual average TAP emission rates for arsenic, nickel, and chromium VI, which assume a maximum annual production limitation of 45,000 cubic yards per year (cy/yr). Because these sources are located very close together, as shown in the site plan included with the application package, the sources were collocated in the modeling. These three sources are designated Silo I, Silo II, and PJ-980 (truck mixer) on the site plan.

As indicated on the attached Form MI2, the four vents for the two silo baghouses are oriented downward while the vent for truck mixing is horizontal. Therefore, as agreed by the DEQ, the procedures recommended in Section 5.4.2 of the *State of Idaho Air Quality Modeling Guidance* were utilized in the modeling for each of the three sources. The stack gas exit velocity was set to 0.001 meters per second (m/s) to prevent momentum plume rise and the stack diameter was set at 0.001 meters (m) to prevent stack-tip downwash. Because each of the vents for the baghouses on the two silos have the same stack gas temperature (ambient) and stack height and were assumed to have the same stack diameter and velocity, the cement delivery to the silo and cement supplement delivery to the silo were each modeled as one point source. The truck mixer has only one baghouse vent. Thus, three point sources were modeled with SCREEN3 and the maximum predicted impacts were added, regardless of the maximum impact location, to obtain the maximum air quality impact from all three sources combined.

The SCREEN3 model input and output files are contained on the enclosed CD. It is important to note that the model input and model output files show stack gas velocities and flow rates of zero, even though a stack gas velocity of 0.001 m/s was input for each of the three sources of emissions. The change from 0.001 m/s to 0.000 m/s was made internal to the SCREEN3 model and could not be prevented or changed. Additional model runs were conducted to determine any possible effect of this internal model change on the predicted results. No change to the model results was noted. As a check, the truck mixer was modeled with its actual inside stack diameter and a velocity of 0.001 m/s. The results of the modeling for both simple and complex terrain were identical to those predicted utilizing the assumed stack diameter of 0.001 m. For the silos, the change to the actual stack diameter and use of a 0.001 m/s velocity resulted in the same internal modeling change to a 0.000 m/s velocity. Based on these additional model runs and calculated flow rates, it is believed that this internal model change is the result of the extremely low flow rate associated with the very small stack diameter and very low exit velocity. These model runs are also included on the attached CD.

It is also important to note that consideration was given to the modeling of alternative operating scenarios. Analysis of alternative scenarios is sometimes required because higher ambient concentrations may be predicted with lower plume heights, even if emissions are lower as well. However, since an exit velocity of 0.001 m/s was assumed in the modeling to account for the horizontal and downward-facing vents, use of lower flow rates was not possible and maximum impacts would be predicted utilizing the maximum emission rates.

3.0 GEP ANALYSES AND BUILDING DIMENSIONS

GEP stack height is the minimum stack height that will prevent a plume from a stack from being entrained in the wake of nearby obstructions. For stacks which are less than GEP height, these downwash effects increase air pollutant concentrations. A GEP analysis was conducted for the two silos and truck mixer. The analysis was conducted following EPA's revised *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulation)* (June 1985).

The GEP formula stack height is defined as follows:

$$H_{GEP} = H_b + 1.5L$$

where H_{GEP} = the formula GEP stack height,
H_b = the nearby building height above stack base height,
L = the lesser of H_b or the maximum projected width of the building, and
nearby = the distance up to 5L within 800 meters of the stack.

Each of the structures listed on the attached Form MI4, Buildings and Structures, and shown on the enclosed site plan was evaluated to determine whether the stacks for the three sources to be modeled were located within the area of influence of (nearby) the structure. These structures include those for the proposed CBP and those for the former CBP located at the site in Osburn. All structures were assumed to have the same base elevation of the stacks included in the modeling. The stacks were determined to be within the influence (within 5L) of seven of the listed structures. These seven structures were the taller tier of the Storage Building by the former CBP, the former CBP Building, the proposed CBP Building, Silos I and II for the proposed CBP, the Aggregate Bin for the proposed CBP, and the Office building. The formula GEP stack height for these seven structures were calculated as 67.5 feet, 127.5 feet, 75 feet, 68 feet, 54 feet, 79.45 feet, and 45 feet, respectively. Thus, the structure resulting in the greatest formula GEP height for all of the stacks modeled was 127.5 feet for the former CBP Building. This building is 50 feet in length, 45 feet in width, and 15.55 meters (51 feet) in height. The maximum projected width for this structure is 67.27 feet. Thus, the structure is squat and the formula GEP stack height is 2.5 times the building height or 127.5 feet (51 x 2.5). In accordance with Section 5.4.4, Building Downwash Parameters, of the *State of Idaho Air Quality Modeling Guidance*, the building with the greatest GEP stack height should be used in the SCREEN3 modeling analysis. Therefore, the proposed CBP building was used in the SCREEN3 modeling of TAPs from the proposed CBP.

4.0 SCREEN3 MODELING

The EPA's SCREEN3 model was used for the screening modeling of Zanetti Bros. proposed CBP for both simple and complex terrain. Each of the air emission sources (cement delivery to silo, cement supplement delivery to silo, and truck mixing) was modeled separately, as only one stack can be included in an individual run in the SCREEN3 model. The maximum impacts predicted for each of the three sources were added, without consideration of the location of the maximum impact, for comparison to the AACC for each of the three TAPs.

4.1 MODEL OPTIONS

The regulatory default options were selected for the modeling analyses. Fumigation due to inversion break-up was considered but not shoreline fumigation, and rural dispersion was selected as agreed by the DEQ. The model was run for all stability and wind speed categories internal to the model. The ambient temperature will be set to 68°F, and an anemometer height of 10 meters was assumed.

4.2 RECEPTOR NETWORK

The receptors listed in the attached table were included in the screening modeling for simple terrain and for complex terrain (including intermediate terrain). Simple terrain receptors were selected based on the distance from Silo I, located between Silo II and the truck mixer vent by plotting circles of radii equal to 50-meter intervals out to one kilometer. A worst-case terrain height was assigned to each radius by identifying the highest elevation (generally to the nearest 10 feet) within the band formed by circles of radii midway between the two adjoining receptor circle radii, and subtracting the base elevation of the stacks. The 100-meter radii to a distance of one kilometer are shown on the enclosed topographic maps.

Most of the Zanetti Bros. property boundary is fenced, as shown in the enclosed site plan. Public access to the facility property is restricted and there are gates at the entry ways to the site. The closest distance from any of the three stacks to the property boundary of the Zanetti Bros. facility is 122 meters and occurs to the north-northwest near I90. Therefore, the closest receptor was placed at 122 meters in the modeling. Because terrain in this area is slightly less than the base elevation of the stacks, this receptor was assumed to have a zero height above the stack base. The closest residential areas to the stacks are located in a southwesterly direction and terrain heights increase closest to the property in this direction. The closest distance from the stacks to the property boundary in a southwesterly direction is approximately 150 meters. Thus, the second receptor was placed at 150 meters from the stacks. The nearest school (Silver Hills Elementary) is located approximately 700 meters to southeast of the stacks. No school is located to the northwest of the site as shown on the topographic map. As discussed below, the maximum impacts from all three sources was predicted to occur at the receptor closest to the stacks. It is important to note that no terrain heights above stack-top height are allowed for the simple terrain in SCREEN3. Therefore, for each of the sources modeled, terrain heights were set equal to stack-top height for all receptors with heights above stack-top height.

Maximum impacts in areas of complex terrain are often located approximately ten meters below plume centerline height under stable conditions, where plume impaction occurs, because the closest approach distance allowed by the model between the plume centerline and any terrain is ten meters. The SCREEN3 model was used to estimate stable plume heights for each of the stacks. However, for the three stacks modeled, 10 meters below stable plume centerline height was determined to be below stack height. The maximum impacts predicted with the Valley-mode calculation procedures in SCREEN3 were expected to occur at the closest receptor to the stack with a height equal to stack-top height. As the model cannot accept terrain heights equal to or less than stack-top height for the Valley-mode calculations, a receptor was placed at the closest distance to the stacks with a height equal to stack-top height. The height of this closest receptor was set equal to stack-top height plus one foot.

4.3 Averaging Periods

The SCREEN3 model predicts one-hour impacts for simple terrain and 24-hour impacts for complex terrain. The impacts for other averaging times must be estimated from these one-hour and 24-hour concentrations. For simple terrain, the maximum annual impacts were calculated by multiplying the maximum predicted one-hour concentration by 0.125 as required by Section 210.03.a.i. of IDAPA 58.01.01.

For the complex terrain receptors (including intermediate terrain), the maximum 24-hour impact was converted to a one-hour average impact by multiplying the 24-hour concentration by a factor of four. If the maximum one-hour impact calculated for complex terrain was greater than the maximum one-hour impact predicted with the simple terrain procedures, then the maximum impact for the annual averaging period would be estimated by applying a factor of 0.125 to the calculated one-hour impact.

5.0 MODEL RESULTS

The SCREEN3 model output showed a maximum cavity length of approximately 24 meters or 79 feet. The closest distance to the property boundary of the Zanetti Bros. Osburn facility from the edge of the controlling structure (i.e., the former CBP Building) is 280 feet. Therefore, the cavity region does not extend off property and is not located in ambient air. For this reason, the concentrations predicted by SCREEN3 in the cavity region were not considered in the TAP compliance demonstration.

The results of the SCREEN3 modeling are presented in the attached table. As shown in the table, assuming a unit emission rate, the maximum one-hour average concentrations predicted in simple terrain were greater than those predicted for complex terrain. As expected due to the relatively low stack heights and the downward-facing and horizontal release points, the maximum concentrations were predicted for the receptor closest to the stacks at a distance of 122 meters. The maximum one-hour average concentrations for each air emission source were determined by ratioing the predicted concentration (at a unit emission rate) by the lb/hr emission rates for arsenic, nickel, and chromium VI. The one-hour average concentrations were then summed to obtain a total one-hour impact for each

TAP. Maximum annual impacts for each TAP were then calculated by applying a factor of 0.125 to the maximum one-hour concentrations. As shown in the table, the maximum annual concentrations for the three sources combined were less than the AACCs for each of the three TAPs. Thus, compliance is demonstrated for the proposed CBP.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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PERMIT TO CONSTRUCT APPLICATION
Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Zanetti Bros., Inc.
Facility Name:	Zanetti Bros., Inc. Facility
Facility ID No.:	079-00004
Brief Project Description:	Concrete Batch Plant, Previously Permitted Rock Crusher

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
Silo I	PJC-300S	576,053.90	5,261,712.51	771.04	15.24	(2) 11/ 16"x48" slots, (2) 5/8"x30" slots	ambient	1,500.00	11.59	downward
Silo II	PJC-300S	576,056.52	5,261,709.55	771.04	10.97	(2) 11/ 16"x48" slots, (2) 5/8"x30" slots	ambient	1,500.00	11.59	downward
Mixer/Shroud	PJ-980	576,051.18	5,261,715.36	771.04	7.62	15 3/4" x 21"	ambient	5,880.00	13.02	horizontal

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Zanetti Bros., Inc.
Facility Name:	Zanetti Bros., Inc. Facility
Facility ID No.:	079-00004
Brief Project Description:	Concrete Batch Plant, Previously Permitted Rock Crusher

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Shop	134.00	60.00	770.84	9.15	1	Additional buildings**: Office, 60 ft (length), 24 ft (width), 5.49 m. (height), 1 (number of tiers)
Maintenance Warehouse	180.00	48.00	770.84	9.15	1	Shed # 11, 15 ft (length), 13 ft, (width), 1.89m (height), 1 (number of tiers)
Shed #1	8.00	8.00	770.84	2.74	1	
Shed #2	10.00	10.00	770.84	3.66	1	
Shed #3	16.00	7.00	770.84	3.66	1	**Unable to add another row due to the password-protected spreadsheet.
Shed #4	10.00	7.00	770.84	3.66	1	
Shed #5	30.00	18.00	770.84	3.66	1	
Shed #6	20.00	19.00	770.84	3.66	1	
Shed #7	27.00	12.00	770.84	3.66	1	
Shed #8	18.00	10.00	770.84	3.66	1	
Shed #9	10.00	10.00	770.84	3.05	1	
Shed #10	15.00	15.00	770.84	3.66	1	
Shed #12	26.00	14.00	770.84	5.49	1	
Shed #13	20.00	17.00	770.84	5.49	1	
Shed # 14	12.00	10.00	770.84	5.49	1	
Diesel AST - West	9 ft. diameter		770.84	6.71	1	
Diesel AST - East	9 ft. diameter		770.84	6.10	1	
Storage Building by former CBP	80.00/90.00	40.00	770.84	8.23/5.49	2	
fCBP - Exterior silos	12 ft. diam.		770.84	13.72	1	
fCBP - Building	50.00	45.00	770.84	15.55	1	
fCBP - Hopper	40.00	15.00	770.84	3.05	1	
CBP - Building/Aggregate Bin	75.00/24.00	35.00/15.00	770.84	9.15/11.28	2	
CBP - Silo I	12 ft. diam.		770.84	15.24	1	
CBP - Silo II	12 ft. diam.		770.84	10.98	1	
Hoppers (collectively)	56.00	12.00	770.84	4.88	1	

SCREEN3 MODEL RESULTS

Zanetti Bros., Inc.
Osburn, Idaho

Air Emissions Source	Maximum 1-hour Concentration @1 lb/hr ($\mu g/m^3$)		Emission rate (lb/hr annual average)			Maximum 1-hour Concentration ($\mu g/m^3$)		
	Complex Terrain	Simple Terrain	Arsenic	Nickel	Chromium VI	Arsenic	Nickel	Chromium VI
Cement delivery to silo	13.20	122.34	5.35E-09	5.27E-08	7.31E-09	6.55E-07	6.45E-06	8.94E-07
Cement supplement to silo	13.26	160.19	1.88E-07	4.28E-07	6.86E-08	3.01E-05	6.86E-05	1.10E-05
Truck mixer (loadout)	13.38	183.66	4.40E-09	1.72E-08	3.52E-09	8.08E-07	3.16E-06	6.46E-07
Total 1-hour Average Concentration						3.16E-05	7.82E-05	1.25E-05
Total Annual Average Concentration						**3.95E-06**	**9.77E-06**	**1.57E-06**
AACC						**2.3E-04**	**4.2E-03**	**8.3E-05**

Notes:

1) Maximum 1-hour concentrations for complex terrain were calculated by multiplying the maximum predicted 24-hour concentrations by four.
2) Emission rates were based on emission factors from Table 11.12-8 of AP-42, Section 11.12 Concrete Batching and the maximum annual production rate of 45,000 cubic yards per year.
3) Maximum 1-hour concentrations utilizing actual TAP emission rates were calculated from the maximum 1-hour concentrations predicted by SCREEN3 at one (1) lb/hr in simple terrain because concentrations predicted in simple terrain were greater than concentrations predicted with the Valley-mode procedures for intermediate and complex terrain.
4) Total annual average concentrations were obtained by multiplying the total one-hour average concentrations by a factor of 0.125.

SCREEN3 RECEPTORS

Zanetti Bros., Inc.
Osburn, Idaho

SIMPLE TERRAIN		
Distance (m)	Elevation (ft)	Height (ft)
122	2525	-4
150	2540	11
200	2542	13
250	2547	18
300	2549	20
350	2552	23
400	2560	31
410	2579	50
450	2660	131
500	2760	231
550	2880	351
600	2950	421
650	3010	481
700	3040	511
750	3100	571
800	3140	611
850	3180	651
900	3240	711
950	3270	741
1000	3320	791

COMPLEX TERRAIN		
Distance (m)	Elevation (ft)	Height (ft)
410	2580	51
450	2660	131
500	2760	231
550	2880	351
600	2950	421
650	3010	481
700	3040	511
750	3100	571
800	3140	611
850	3180	651
900	3240	711
950	3270	741
1000	3320	791

Notes:

1) Height is the height above stack base elevation of 2529 feet.
2) Heights greater than stack-top height were assumed equivalent to stack-top height for simple terrain.
3) The closest distance with a height equal to stack-top height was selected as the first complex terrain receptor. The height for that closest receptor was set equal to one foot above stack-top height. The first complex terrain receptor shown is for the cement delivery to the silo. For cement supplement delivery to silo, the first complex terrain receptor was 430 meters with a height of 37 feet. For the truck mixer, the first complex terrain receptor was 369 meters with a height of 26 feet.